



BCM 1220

AUTOMATIC BATTERY CHARGER

INSTALLATION, OPERATING & SERVICE MANUAL

PM004 Rev 2 00/09/21

1. INSTALLATION

Ensure that the battery charger is securely installed in a dry location where it will receive adequate ventilation. The ambient air temperature around the battery should not exceed 40°C. Connect a 120VAC or 240VAC, 50/60Hz, 15AAC supply circuit, c/w grounding conductor, to the battery charger supply terminals. Note: The internal transformer is reconnectable with jumpers for 120 or 240VAC input. Caution: The charger is supplied for 120 VAC input as standard. Connect the DC output to the battery to be charged. Excessively long or undersized DC leads will reduce the battery charger's output and will increase the time required to re-charge the battery. It is essential to observe the DC polarity. Ensure that all electrical connections are made in accordance with the applicable regulatory authorities.

CAUTION!

Batteries may produce explosive gases when being charged. Do not make electrical sparks or introduce flame of any kind in vicinity of a battery. It is recommended that all electrical loads be disconnected from the battery and charger during adjustment procedures. Always isolate the charger from the supply and the battery before making any electrical connections or adjustments. All servicing procedures should be undertaken by a qualified technician only. Dangerous voltages are present within the charger which may cause injury or death.

2. FLOAT & EQUALIZE MODES

NOTE: If the charger is equipped with an APB 1210 alarm/control module, please refer to section 6.

The charger has been factory adjusted for correct "float" and "equalize" voltage levels for standard lead-acid batteries. The selection of "float" or "equalize" is controlled by the "float/equalize" switch or an optional manual equalize timer.

The "float" voltage is adjusted to a specific voltage in order to maintain the battery in a fully charged condition. This is the normal mode for continuous operation. The "equalize" voltage is adjusted to a specific voltage higher than "float". A battery should be "equalized" periodically in order to ensure that all cells are equally and fully charged.

In either "float" or "equalize" mode, the charger will automatically adjust its output current between zero and full output as required to maintain the correct voltage.

WARNING: Never leave the switch in the "equalize" position for long periods of time (6 hours per month is adequate for most installations). Excessive "equalize" charging will cause cells to gas (through electrolysis) and consume excessive quantities of electrolyte. Never let the electrolyte level drop below the minimum level line of the battery.

Factory preset levels (for lead-acid batteries):

<u>Battery Voltage</u>	<u>Float</u>	<u>Equalize</u>
12VDC Nominal	13.5	14.5
24VDC Nominal	27.0	29.0

Current Limit is set at 100% of nameplate rating.

3. OUTPUT ADJUSTMENTS

3.1. "FLOAT" VOLTAGE ADJUSTMENT

CAUTION!

Do not leave battery charger energized if the current output exceeds the unit nameplate rating. If necessary re-adjust the battery charger's current limit setting **before** adjusting float/equalize settings.

- 3.1.1. Attach a precision voltmeter of the correct range in parallel with the battery. (Accuracy should be better than +/- 0.5%.)
- 3.1.2. Switch the charger's switch to "float". (If the charger is equipped with an automatic timer, the timer may have the unit in equalize. Allow the charger to equalize charge until the timer times out.)
- 3.1.3. Wait until the battery voltage stabilizes. (The output current should be almost zero, unless a load is also connected to the battery. This may take many hours!)
- 3.1.4. If the voltage is incorrect adjust the float potentiometer located on the printed circuit card. Turn the adjusting screw clockwise to increase voltage, and counterclockwise to reduce voltage. Adjust in small increments, allowing voltage to stabilize after each adjustment. (If the float adjustment is changed, it will be necessary to recalibrate the equalize adjustment also.)

3.2. "EQUALIZE" VOLTAGE ADJUSTMENT

NOTE: Set "float" before proceeding with equalize adjustment.

- 3.2.1. Switch the charger to the "equalize" mode with switch.
- 3.2.2. Wait until the battery voltage stabilizes. (The output current should be almost zero, unless a load is also connected to the battery. This may take many hours!)
- 3.2.3. If the voltage is incorrect, adjust equalize potentiometer located on the printed circuit card. Turn the adjusting screw clockwise to increase voltage, and counterclockwise to reduce voltage. Adjust in small increments, allowing voltage to stabilize after each adjustment. When properly set, return the switch to "float".

3.3. "CURRENT LIMIT" ADJUSTMENT

NOTE: The "current limit" potentiometer is located on the printed circuit card. It is factory set at 100% of the nameplate rating. Do not exceed this setting or damage to the charger may result.

During any testing or adjustment of the charger, observe the charging current. In the event that the current exceeds the nameplate rating, current limit adjustment is required before further operation.

- 3.3.1. It is necessary to connect the charger to a lower than nominal voltage load. This may be accomplished by either:
 - Cranking the engine, preferably with the engine disabled to prevent it from cranking, or;
 - Connecting the charger to a partial battery (if inter-cell jumpers are exposed) or one of a lower voltage (eg. 12 volt battery for 24 volt charger).
- 3.3.2. Observe the output current. If the current is within 10% of the nameplate rating, adjustment is not required.
- 3.3.3. To adjust current limit, turn the potentiometer on the printed circuit board (clockwise to decrease). Do not energize the AC supply, except momentarily, until you are sure the current limit is not set too high.

4. **DISCONNECTING THE BATTERY (e.g. For Engine Servicing)**

Always turn off the AC supply before disconnecting the battery. This will prevent sparks, and will ensure that electrical circuits are not fed by the charger alone, which could cause damage.

5. CONNECTIONS

CAUTION!
 Before energizing battery charger AC supply, verify correct AC supply voltage as indicated on the unit rating plate.

CAUTION!
 Before connecting live battery to the battery charger, verify DC voltage output as indicated on the unit rating plate and correct polarity.

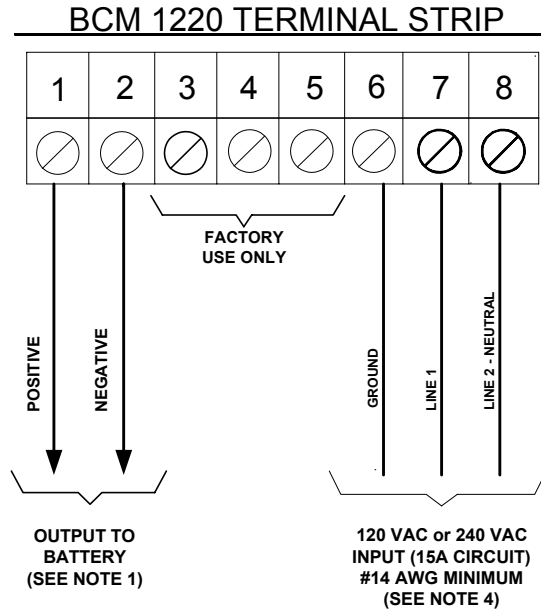
Note: Reverse polarity will result in zero output from battery charger.

NOTES:

- Recommended Wire Size (AWG):

Output	5A	10A	15A	20A
Up to 10 ft.	14	12	10	10
Up to 25 ft.	12	10	8	8

- 2 - 1/2" knockouts are provided in the bottom of the enclosure.
- Install the battery charger where it will have unrestricted airflow; maximum recommended ambient temperature 104°F.40°C.
- The transformer is reconnectable with jumpers for 120 or 240VAC input.



Note: Specifications subject to change without notice.

6. OPTIONAL APB 1210 ALARM / CONTROL MODULE

The optional APB 1210 alarm/control module is divided into two sections, as follows. (Any or all of these features may be provided according to requirements):

6.1. ALARM SECTION

6.1.1. A.C.Fail

Indicates a loss of A.C. power supply to the charger (The charger must be connected to the battery for visual indication to be operative. The alarm contact does not require the battery to alarm).

6.1.2. Rectifier Fail

Indicates an S.C.R. failure in the power circuit of the charger.

6.1.3. Low Battery Voltage

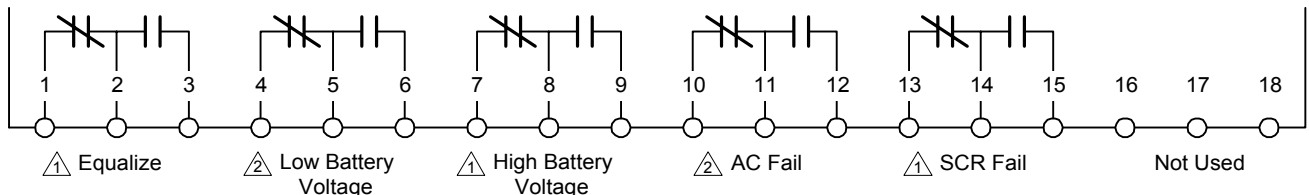
Indicates that the battery voltage has dropped below a preset voltage for longer than three minutes. The factory voltage setting is 95% of nominal FLOAT voltage for lead acid batteries (12.8VDC for 12VDC battery, 25.6VDC for 24VDC battery).

6.1.4. High Battery Voltage

Indicates that the battery voltage has risen above a preset voltage for longer than 10 seconds. The factory high voltage setting is 125% of nominal EQUALIZE voltage for lead acid batteries (15.2VDC for 12VDC battery, 30.4VDC for 24VDC battery).

6.2. ALARM CONTACTS

- Shown with charger in normal operation (float mode).
- Rated 0.5A @ 110VAC, 2A @ 24VDC, Form "C".
- Connections to contacts are made to Terminal Block mounted on APB 1210 Printed Circuit Board.



- △ Relay contacts shown in de-energized (non-alarm) state (relays pick-up upon alarm condition).
- △ Relay contacts shown in de-energized (alarm) state (relay energizes upon normal state and drops out on failure).

6.3. CONTROL SECTION

NOTE: When the APB 1210 control section is provided, the standard "FLOAT/EQUALIZE" switch on the charger upper faceplate is relabelled to "FLOAT ONLY/AUTO MODE". With this switch in the "FLOAT ONLY" position, the control section of the APB module is effectively bypassed and the charger will only float charge the battery. With this switch in the "AUTO MODE" position, the charger is controlled by the APB module. With the APB 1210 removed, the switch reverts to standard Float/Equalize functions. This is provided to allow servicing of the APB module and retain use of the battery charger.

6.3.1. Float Mode Control

Operation of the pushbutton in this section called "return to float" will cause the charger to return to float, from the equalize mode as indicated by the green "FLOAT CHARGING" L.E.D.

This will bypass the remaining duration of the equalize timer, and allows the operator to test the equalize mode, without going through a full time period.

6.3.2. Equalize Mode Control

Equalize mode may be initiated by depressing the manual start button until the yellow L.E.D. (Equalize timer running light) illuminates. Equalize mode may also be optionally initiated by the following, as indicated by the labeling on the APB faceplate:

6.3.2.1. Automatic Period Timer

Factory set for once every 28 days unless otherwise specified.

6.3.2.2. Battery Voltage Dip

Factory set at 75% of nominal battery voltage.

6.3.2.3. Return of AC power supply.

7. CONNECTION OF LOOSE APB TO BCM BOARD

Insert all the way down the header female connector of APB Board into the six pin white male connector of BCM Board.

Note: APB header female connector can plug in only in one direction.

NOTES:

- 1) It is recommended that adjustments to the APB 1210 be done at the factory only, since instruments are required.
- 2) The equalize period is the same for all methods of initiating. Factory setting is 6 hours unless otherwise specified.